A NOTE ON THE BRITISH SPECIES OF *WILLEMIA* (COLLEMBOLA: HYPOGASTRURIDAE) WITH A KEY TO THE SPECIES

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Introduction

In Kloet & Hincks (1964), only one species of *Willemia*, *W. anophthalma* Börner, was recorded from Britain. Here four more species are added, notes are given on the distribution of specimens in my collection and in the collection of the British Museum (Nat. Hist.), and a short diagnosis is given of each species. The key should be used in conjunction with the list of diagnoses if a specimen is to be identified with certainty. I expect that further species will be found in this country in due course. One of the species recorded here, (*W. scandinavica* Stach), is known from Britain only from one damaged specimen, but there is little doubt as to its identity. Another, *W. intermedia* Mills, is probably more widely spread than my records indicate, but material from other localities was in poor condition and could not be identified with certainty.

Key to the British Species of *Willemia*

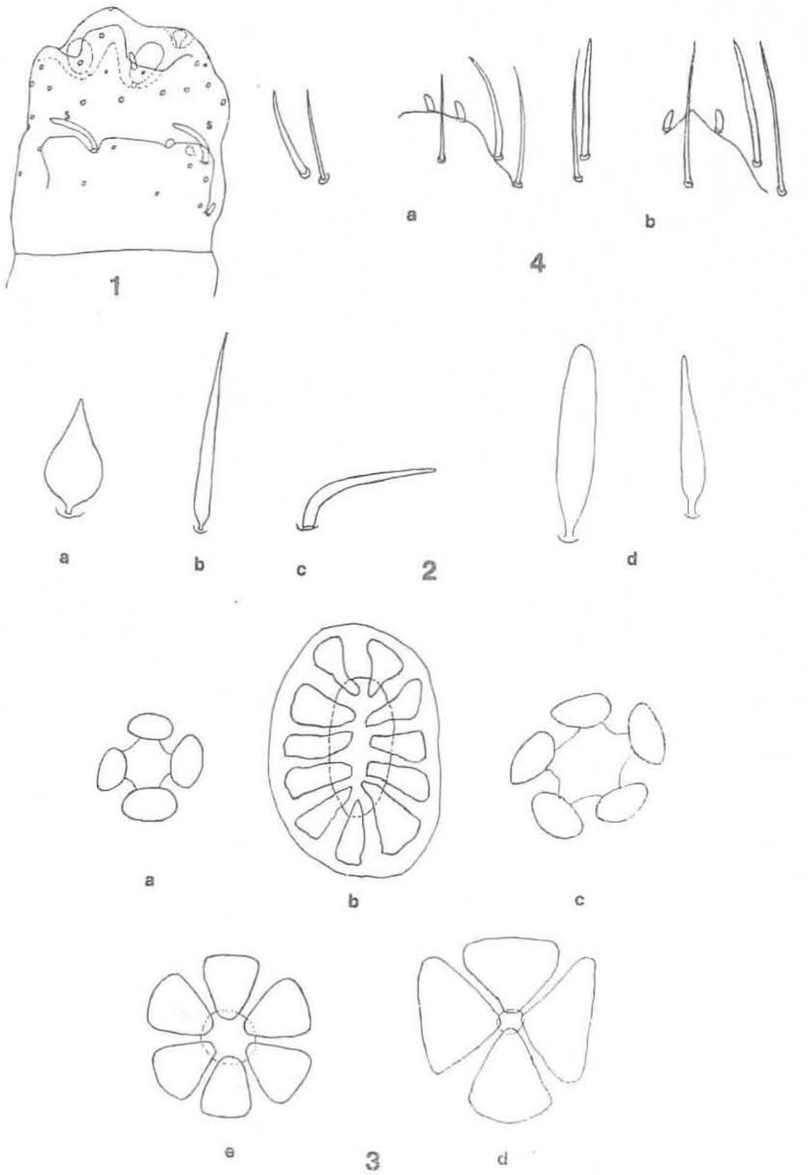
1.—Anal spines present; olfactory setae on antenna IV much longer than broad, as in figs. 2b, 2c and 2d 2
— Anal spines absent; olfactory setae on antenna IV not much longer than broad (fig. 2a) .... *aspinata*
2.—Antenna IV with 2 large subterminal vesicles as in fig. 1; postantennal organ with about 12 vesicles arranged in an ellipse as in fig. 3b........*buddenbrocki*
— Antenna IV without large subterminal vesicles; postantennal organ with 4 to 7 vesicles around a central boss as in figs. 3c, 3d and 3e........ 3
3.—Vesicles of postantennal organ ovoid, not much larger than, often smaller than, central boss (fig. 3c); antenna IV with 5 olfactory setae similar in size and shape to the lateral sensory setae in the sense organ on antenna III ('s' in fig. 1)........ *anophthalma*
— Vesicles of postantennal organ triangular, generally larger than the central boss of the organ (fig. 3d and 3e); antenna IV with 4 or 5 olfactory setae which are shorter and thicker than the lateral sensory setae in the sense organ on antenna III ('s' in fig. 1) 4
4.—Postantennal organ generally with 4 vesicles (fig.3d); cuticular ridge of sense organ on antenna III sub-linear (fig. 4a) .... *intermedia*
— Postantennal organ generally with 6 vesicles (fig. 3e); cuticular ridge of sense organ on antenna III sharply angled (fig. 4b)........*scandinavica*

Descriptions of Species

W. anophthalma Börner, 1901

0.40–0.73 mm; antenna IV with 5 bent cylindrical olfactory setae as in fig. 2c, large subterminal vesicles absent; postantennal organ with 4 to 6, usually 5, vesicles arranged around a central boss as in fig. 3c; empodium nearly $\frac{1}{2}$ as long as claw, without basal lamella; 2 minute anal spines present, about $\frac{1}{2}$ as long as claw III.

Material.—BERKS., near Ascot, in oak litter, 1.vi.67. OXON., Peppard, in beech litter, 7.x.67. SURREY, Cobham, in woodland moss, 8.iv.68. BUCKS., Littleworth Common, in mixture of rotten wood/moss/leaf litter, 8.iii.71, P. J. Edwards. WILTS., Berwick St. James, in top 10 cm of chalk soil, 11.ix.70. CHESHIRE, near Macclesfield, Alderley Park, in woodland litter (throughout top 15 cm), xii.70 F. S. Downing. DORSET, Studland Heath, in humus under myrtle, 5.xi.63, P. N. & K. Lawrence,



Figs. 1–4.—British species of *Willemia*: 1, antenna III and IV of *W. buddenbrocki*, showing major sensillae and positions of setae (after Hüther, 1959); 2, olfactory setae on antenna IV of: a, *W. aspinata*; b, *W. buddenbrocki*; c, *W. anophthalma*; d, *W. intermedia*; 3, postantennal organ of: a, *W. aspinata*; b, *W. buddenbrocki*; c, *W. anophthalma*; d, *W. intermedia*; e, *W. scandinavica*; 4, sense organ on antenna III, (after Hüther, 1959) of: a, *W. intermedia*; b, *W. scandinavica*.

B. M. 1963–641, L 2268. DORSET, Morden Bog, in conifer humus, 4 and 13.xi.63, P. N. & K. Lawrence, B. M. 1663–641, L 2258, L 2403. HUNTS., Holme Fen, in birch humus, 23.ix.63, P. N. & K. Lawrence L 2176. LANCS., Boggle Crag, among mosses and lichens, 26.ix.62, P.N. & K. Lawrence L 1553, 'Roslin, 1.v.37.'

Distribution.—Europe including various parts of Britain, Scandinavia, U.S.S.R., Greenland, Jan Mayen Island, Canada, Iceland, Algeria.

W. aspinata Stach, 1949

0.55–0.75 mm; antenna IV with olfactory setae shaped as in fig. 2a, large subterminal vesicles absent; postantennal organ with 3 to 5 vesicles, usually 4, arranged around a central boss as in fig. 3a; empodium nearly ½ as long as claw, without basal lamella; anal spines absent.

Material.—CHESHIRE, near Macclesfield, Alderley Park, in woodland litter, xii.70. F. S. Downing. BUCKS., Burnham Beeches, in oak litter, 8.iii.71, P. J. Edwards. DORSET, Studland Heath, in conifer humus, 6.xi.63, P. N. & K. Lawrence, L 2299. DORSET, Arne Big Wood, in conifer/bracken/rhododendron humus, 14.xi.63 P. N. & K. Lawrence, B. M. 1963–641, L 2439. KENT, Keston Common, in conifer humus in boggy area, 25.xi.62, P. N. Lawrence, L 1669. OXON., Peppard, in beech litter, 7.x.67.

Distribution.—Europe, Britain, Scandinavia, U.S.S.R.

W. buddenbrocki Hüther, 1959

0.39–0.43 mm; antenna IV with 5 olfactory setae shaped as in fig. 2b, also with 2 large subterminal vesicles in a cavity as in fig. 1; postantennal organ with about 12 vesicles arranged in an ellipse as in fig. 3b; empodium rudimentary; anal spines slightly longer than claw III.

Material.—near Cirencester, Tarlton, 16–20 cm deep in soil on limestone, 17.iv.70; 10–12 cm, 14–16 cm, 16–18 cm, 20–22 cm and 22–24 cm deep 18.v.70; 22–24 cm and 28–30 cm deep 16.x.70.

Distribution.—Britain, Germany.

W. intermedia Mills, 1934

0.4–0.6 mm; antenna IV with 5 thick olfactory setae, of which 3 are pointed and 2 are blunt (fig. 2d) large subterminal vesicles absent; postantennal organ with 4 more or less triangular vesicles around a small central boss (fig. 3d); empodium nearly ½ as long as claw, without basal lamella; 2 minute anal spines present.

Material.—BERKS., Jealott's Hill, Broadricks, in arable clay loam, 25.x.67, 8.x.70, 10–12 cm deep 9.x.70.

Distribution.—Britain, Germany, Finland, U.S.A.

W. scandinavica Stach, 1949

0.5–0.7 mm; antenna IV with 4 olfactory setae (c.f. left-hand seta in fig. 2d), large subterminal vesicles absent; postantennal organ with about 6 vesicles (fig. 3e); empodium ½ as long as claw, without true lamella but broader in its basal half; anal spines about ½ as long as claw III.

Material.—Near London, Chislehurst Caves, viii.35.

Distribution.—Britain, Germany, Finland.

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